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S&PF Reports on Pest Conditions in South for 1982

Pest management specialists Neil Overgaard and Dale Starkey recently summarized forest insect and disease conditions in the South for 1982. Excerpts on pests of direct concern to the IPM Program follow:

Southern Pine Beetle

After dwindling to almost no activity in the latter part of 1981 and the first part of 1982, southern pine beetle (SPB) activity increased to epidemic levels on a total of 7,327,500 acres in portions of Alabama, Arkansas, Georgia, Louisiana, Mississippi, Texas, and South Carolina during the late summer and fall of 1982. Approximately 5,367 thousand cubic feet (MCF) were salvaged by the end of October with approximately 20 percent of this volume from National Forest land. Spots tended to be large with a high infested green to infested red tree ratio. This indicated increasing populations during a period when they usually decrease. If conditions remain favorable, infestations are expected to increase during 1983.

SPB infestations were rare during the early part of the year in Alabama. But by late summer, activity reached epidemic levels in Butler, Clarke, Conecuh, and Marengo Counties. Infestations were also found in 21 other counties. Statewide, 322 spots containing 6,325 infested trees were recorded.

In Arkansas, southern pine beetle activity picked up for the first time since 1978-79. The activity was initially reported in early spring on the Caney Creek Wilderness Area on the Mena Ranger District, Ouachita National Forest. At that time, the outbreak seemed to be declining. However, by late summer beetle populations were epidemic on both the Mena and Caddo Ranger Districts. State survey crews also picked up activity in Union, Clark, Little River, Howard, and Pike Counties.

A total of 993 SPB spots were detected in Georgia during July. Beetle activity was at epidemic levels in a few counties. Populations also reached epidemic levels on the Oconee National Forest.

SPB activity in Louisiana increased in late summer 1982. A total of 442 multiple tree spots had been located by October. Twenty-six scattered parishes reported infestations. However, one-third of the spots were concentrated in East and West Feliciana Parishes. By November 1, an estimated 200 spots with 1,720 MCF of timber had been salvaged. The volume salvaged was expected to double by January 1983. In addition, the Kisatchie National Forest removed 15 spots containing 100 MCF of timber.

An aerial survey in July 1982 showed 751 multiple tree SPB spots in Mississippi, with most of the spots located in 6 counties in the southwestern portion of the State. The remaining spots occurred in two north central counties. Volume losses as of October were 57 MCF of sawtimber on private land. In addition, the Homochitto National Forest salvaged 1,800 MCF from 423 spots. Low beetle activity was also noted in counties adjacent to the infested areas. A severe problem is expected next spring.

SPB reached epidemic levels in a 3.6 million acre area in 17 Piedmont and Coastal Plain counties in South Carolina. As of September, 3,184 spots had been detected involving an estimated 1,433 MCF of timber. SPB activity on the Francis Marion National Forest is epidemic. Activity is not yet epidemic on the Sumter National Forest, but is expected to increase in the spring of 1983. Approximately 280 MCF of pine timber was salvaged on National Forest land in South Carolina.

Significant SPB activity occurred in east Texas for the first time in 5 years. Approximately 400 multiple tree infestations were detected. Much of this activity was on the Sabine National Forest, where

700 MCF of timber was salvaged from 165 spots on the Yellow Pine Ranger District. An additional 30 spots and 30 MCF were salvaged on the Angelina National Forest. Many spots originated in lightning-struck pines or in densely stocked stands. Beetle activity was also detected in Walker, San Augustine, Tyler, Angelina, Hardin, and Jasper counties. An estimated 630 MCF of timber was salvaged on private industrial and nonindustrial lands as of October 1982.

Six counties in Virginia reported minor southern pine beetle activity.

Littleleaf Disease

Littleleaf disease is the most damaging disease of shortleaf pine in the South. This disease is caused by a complex of factors, including the fungus *Phytophthora cinnamomi* Rands, poor site (especially nitrogen-deficient soils which have been eroded), nematodes, and fungi in the genus *Pythium*. While adequate descriptions of this disease may be found in the pathological literature, no recent loss assessment data are available.

To provide loss estimates for littleleaf disease for the Forest Insect and Disease Information System (FIDIS), a procedure has been devised which uses data from a variety of sources. Published reports of the USDA Forest Service Renewable Resources Evaluation (RRE) groups in Asheville, NC, New Orleans, LA, and Broomall, PA, are the primary sources for these data. Within the limitations of RRE timing of surveys, this method allows easy updating as new information is collected.

Information on number of acres of shortleaf pine infected severely enough to affect forest management indicates the following:

State	Acres (1,000s)
Alabama	228.5
Georgia	576.8
Kentucky	13.4
Mississippi	8.9
N. Carolina	184.7
S. Carolina	204.1
Tennessee	40.7
Virginia	138.0
Total	1,395.1

Fusiform Rust

Fusiform rust continues to be a major management concern across the Southeast. Activity during 1982 remained relatively static, with no major changes in infection levels to report.

Seed Orchard Root Diseases

There are more than 130 seed orchards encompassing more than 10,000 acres throughout the South producing genetically improved seed for regeneration needs in the region. Recent evaluations by State, university, and R-8, S&PF, Forest Pest Management workers have indicated a possible connection between certain routinely applied seed orchard management practices and root disease.

In several orchards, stumps of rogued seed orchard trees have been operationally treated with borax to avoid infection and subsequent damage to residual trees by annosus root rot, *Heterobasidion annosum* (Fr.) Bref. (*Fomes annosus*), for many years. Root disturbances caused by subsoiling (used in orchards to induce flowering), mowing, and the use of power-till seeders (for the application of granular Furadan insecticide to control seed and cone insects) were not considered serious enough to warrant concern. However, root injuries have been associated with two root pathogens, *H. annosum* and *Verticicladiella procera* Kend., in several orchards. While the damage potential of *H. annosum* is well known, the role of *V. procera* is not. Until the complex of factors leading to infection and the likelihood of future damage are more completely understood, investigators have recommended that the use of power-till seeders be suspended and subsoiling reduced in soils that are high-hazard for *H. annosum*. Intensive evaluations will be conducted for 2 years, at which time these and other practices will be reviewed.

New Method for Quantifying Annosus Root Rot Infection to be Used in Two IPM Projects

Two IPM Program-supported projects concerned with annosus root rot and southern pine beetle will be utilizing a new sampling method and predictive equation developed by Sam Alexander at VPI for evaluating the level of annosus root rot infection in thinned pine stands. The projects are being conducted by S&PF Forest Pest Management and Alabama Forestry Commission pest management specialists on the Holly Springs National Forest, Mississippi, and a number of Alabama State demonstration forests, respectively.

Annosus root rot has historically been difficult to study because it infects and damages trees underground where damage is not immediately visible. In

the past, the incidence of infection was determined by the presence of fruiting bodies on tree bases or stumps or by excavating a few major roots and observing symptoms such as resinous or stringy, white rot. These methods overlooked a great number of infected trees where root infection was present but had not yet reached the tree base or even large roots near it.

Alexander's sampling method determines infection levels in thinned, loblolly pine stands on high hazard soils. The method utilizes a cubic foot (ft³) soil-root sample in which the recovered pine roots are counted and the number of infected roots determined by observing symptoms of resinous or stringy, white rot. These data, along with data on d.b.h., radial growth and live crown ratio, are used to calculate average infection levels for the plot. This approach can also be applied to stands when a number of plots are established.

The two IPM Program-supported projects will be using the method on a trial basis this spring. Stands in the Alabama project are principally composed of loblolly but have a few slash pines. On the Holly Springs NF in Mississippi, shortleaf pine is the predominate species, but there are some loblolly pines. An annosus hazard rating will also be validated on the Holly Springs NF using the ft³ sampling technique.

Dr. Alexander recently traveled to Alabama to train both Alabama Forestry Commission and S&PF Forest Pest Management personnel on the theory and field application of the annosus sampling and prediction method.

FPM Methods Applications Group Hosts Impact Assessment Systems Workshop

At the request of the USDA—Forest Service, Forest Pest Management-Methods Application Group headquartered in Ft. Collins, Colorado, Federal, State and university specialists from throughout the United States met in Milliken, Colorado recently to discuss existing and needed integrated pest impact assessment systems and to develop a 5-year task action plan for improving or developing such systems for major regional forest insects and diseases. The FPM-MAG group, under the direction of Bill Ciesla, was assisted in organizing and conducting the facilitated workshop by members of the Adaptive Environmental Assessment Group of the Western Energy and Land Use Team, USDI Fish and Wildlife Service, also headquartered at Ft. Collins, Colorado.

As a result of group and subgroup discussions, workshop participants 1) identified the perceived needs and management constraints of potential users, 2) reviewed the state-of-the-art in developing an integrated pest impact assessment system (IPIAS) for major forest pests with particular reference to the mountain pine beetle in ponderosa and lodgepole pines, 3) identified some critical needs and gaps in understanding that must be filled to develop/refine an integrated pest impact assessment system for specific pests, 4) discussed additional major regional pests or pest complexes (e.g., Douglas-fir tussock moth, spruce budworm, gypsy moth, southern pine beetle) and forest types for which a pest impact assessment system is needed, and 5) developed a generalized 5-year task action plan—general tasks, manpower and dollar needs—with emphasis on the mountain pine beetle in lodgepole pine. Strong recognition was given to the role of FPM-MAG as it relates to the needs of other specialists and resource managers/landowners in Federal, State, industrial and small, private non-industrial organizations.

Workshop participants included representatives from Forest Service Regions 1, 2, 4, 5, 6, 8, Northeastern Area-S&PF, Pacific NW Forest & Range Experiment Station-CANUSA Spruce Budworms Program-West, Intermountain Forest & Range Experiment Station, Rocky Mountain Forest & Range Experiment Station, Southern Forest Experiment Station-IPM Program, Southeastern Forest Experiment Station, Washington Office-FPM staff and Engineering staff-Geometronics, FPM-MAG Group, University of Arizona, Colorado State University, Clemson University, Colorado State Forest Service, Virginia Division of Forestry, and Pennsylvania Bureau of Forestry.

Foresters Can Handle the Information Explosion

The Georgia Council on Continuing Education for Foresters recently held a conference on "SOUTHFORNET: A forest management tool that saves time and money."

The conference highlighted how SOUTHFORNET can help foresters deal with the information explosion. John Wishart (Georgia Pacific), Gordon White (Champion International), Marshall Thomas (F&W Forestry Services), Harry Murphy (Research Management Services), and Stan Adams (U.S. Forest Service) summarized the benefits their respective organizations have realized by using SOUTHFORNET.

SOUTHFORNET (Southern Forestry Information Network) can keep you attuned to new technology. It can help you find specific answers to specific problems. It will lead you to sources or specialists to help analyze the problem and determine your own answer. SOUTHFORNET provides four major services: The Monthly Alert, literature searches, document delivery, and reference and referral service.

For additional information, contact Ginger Ruthford, Science Library, University of Georgia, Athens, 30602 (Tele. 404/546-2477).

Program Investigator Recognized by Atlanta Federal Executive Board

Chuck Dull of the S&PF-FPM Survey Team was one of 25 Federal employees selected recently for special recognition by the Federal Executive Board in the Atlanta area. Of the 30,000 Federal employees in the area, Chuck was recognized for his outstanding work in applying Loran-C radio navigation technology in forest resource aerial surveys. He used Loran-C equipment to quickly and accurately set up aerial surveys to detect and evaluate bark beetle-caused losses over large areas of mixed ownership. The technology is also being used for aerial photo missions and for other forestry uses. Chuck is now the most knowledgeable person in the U.S. on the application of Loran-C in forestry.

This work was funded in part by the Expanded Southern Pine Beetle Program. A USDA Agriculture Handbook (No. 567), "LORAN-C radio navigation systems as an aid to southern pine beetle surveys," is available on request from the U.S. Forest Service, Southern Region, Information Center, 1720 Peachtree Rd., NW, Atlanta, GA 30367.

IPM Handbook on Tree Diseases Available

Fusiform rust, annosus root rot and littleleaf disease cause extensive damage to pine resources in the South. Slash, loblolly and shortleaf pine are most seriously affected. Infection results in plantation failures, reductions in growth and timber quality, and tree mortality. Annual losses are estimated to exceed \$130 million.

Anderson and Mistretta have summarized research results on the three diseases in a new Integrated Pest Management Handbook entitled "Management Strategies for Reducing Losses Caused by Fusiform Rust, Annosus Root Rot and Littleleaf Disease (U.S. Dept. Agric. Agriculture Handbook No. 597). This 30-page booklet describes the significance, symptoms, and a hazard rating system for each disease. In a separate section, accepted prevention and suppression tactics for each disease are integrated into a decision key. Based on local conditions and a listing of management alternatives, resource managers can identify the best management practices to reduce losses caused by these diseases.

Copies of the Handbook may be requested from USDA—Forest Service, Information Distribution Center, Room 816, 1720 Peachtree Road, NW, Atlanta, GA 30367.

New Fact Sheets Available

Forest Pest Management (Southern Region, S&PF) announced the publication of two new southern pine beetle fact sheets. These short (1 page) easy-to-read summaries are intended for foresters who have a limited amount of available reading time. If more detail is needed, the reader can obtain more information by contacting the fact sheet author.

The fact sheets are:

No. 26. Use of computer simulation models to predict expected tree mortality and monetary loss from SPB spots—A research update.

No. 27. A research update: FERRET—The question analysis routine for the southern pine beetle decision support system.

Copies can be obtained by writing Information Center, USDA Forest Service, 1720 Peachtree Rd., NW, Atlanta, GA 30367.

IPS Publication Released

The Georgia Forestry Commission recently published Georgia Forest Research Paper 35—*Ips Engraver Beetles: Identification, Biology and Control*. The publication was co-authored by Program investigators R. C. Wilkinson and J. L. Foltz, Department of Entomology and Nematology, University of Florida.

Research Paper 35 considers beetle identification and biology, how to recognize infested trees, and a complete list of practical control guidelines. The publication is a welcome supplement to Program-sponsored southern pine beetle and tree disease publications.

Copies can be requested from the Georgia Forestry Commission, P. O. Box 819, Macon, GA 31202.

Other Publications

Cook, S. P.; Wagner, T. L.; Flamm, R. O.; Dickens, J. C.; Coulson, R. N. Examination of sex ratios and mating habits of *Ips avulsus* and *I. calligraphus* (Coleoptera: Scolytidae). *Ann. Entomol. Soc. Am.* 76(1): 56-60; 1983.

Florence, L. Z.; Johnson, P. C.; Coster, J. E. Behavioral and genetic diversity during dispersal: Analysis of a polymorphic esterase locus in southern pine beetle, *Dendroctonus frontalis*. *Environ. Entomol.* 11(5): 1014-1018; 1982.

Hyland, J. R. Hazard rating—A strategy for battle against beetle. *Alabama's Treasured Forests.* 2(1): 26-28; 1983.

Kucera, R. Know annosus root rot and react quickly! *Alabama's Treasured Forests.* 1(1): 18; 1982.

Schowalter, T. D.; Coulson, R. N.; Turnbow, R. H.; Fargo, W. S. Accuracy and precision of procedures for estimating populations of the southern pine beetle (Coleoptera: Scolytidae) by using host tree correlates. *J. Econ. Entomol.* 75(6): 1009-1016; 1982.

Thatcher, R. C.; Barry, P. J. Southern Pine Beetle. *For. Insect & Disease Leaflet* 49. Washington, DC; U.S. Department of Agriculture, Forest Service; 1982. 7 p.

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